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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/482,769	01/13/2000	Besma Kraiem	450117-02372	7444

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EXAMINER
MUNOZ, GUILLERMO

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/482,769	Applicant(s) KRAIEM, BESMA	
	Examiner Guillermo Munoz	Art Unit 2634	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7,9 and 10* is/are rejected.

7)☐ Claim(s) *5, 8, and 11-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

The drawings filed on January 13, 2000 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over DVB Document A037 "Implementation Guideline For DVB-T Transmission Aspects", in view of Seki et al. (U.S. Patent Number 5,771,224), Horvath et al. "A Novel, High-Speed, Reconfigurable, Demapper-Symbol Deinterleaver Architecture for DVB-T", and Murakami et al. (U.S. Patent Number 2003/0039322 A1).

In regards to claims 1 and 10; DVB-T teaches a modulation method and radio communication system wherein:

- "As mentioned above, every subcarrier is modulated by a modulation symbol. QPSK, 16-QAM and 64-QAM are used as modulation methods, e.g. 2,4, or 6 bits pr modulation symbol. The bits are assigned to the particular points in the phase space according to the so called Gray-code mapping"(section 1.1, page 8, 7th paragraph).

- "As described above, three different modulation schemes (signals constellations) are available in the DVB-T specification –QPSK, 16-QAM, and 64-QAM. Any of these signal constellations can be combined with any of five different code rates: ½, 2/3, ¾, 5/6, 7/8"(section 1.1.1, page 14, 1st paragraph).

DVB Document A037 teaches that every subcarrier is modulated using a combination of QPSK, 16-QAM or 64-QAM symbols. However, DVB Document A037 does not specifically call for 16-QAM symbols being transmitted with QPSK symbols on a single signal.

Horvath et al, teaches an implementation of the DVB-T system wherein:

- "In hierarchical transmission two MPEG-2 transport streams, referred to as High and Low Priority streams, are transmitted in a combined signal" (page IV-382, section 3, paragraph 1).
- "The two modes differs by means of the channel coding chain, but they use the same inner interleaver. After the inner interleaver, the mapper is employed to convert every v-bits into one complex symbol, selected from a given signal constellation, corresponding to M-QAM digital modulation schemes, where $M=2^v$. DVB-T specifies seven different signal constellations: QPSK (v-2), uniform or non-uniform 16-QAM (v-4) and 64-QAM (v-6). The complex symbols after the mapper, are used to modulate orthogonally spaced carriers" (page IV-383, section 3, paragraph 2).
- "For hierarchiacal transmission both uniform and non-uniform modulation can be used, and the convolution encoder can have different code rates for HP and LP streams" (page IV-383, section 3, paragraph 3).

Therefore, it would have been obvious to one having ordinary skill in the art to combine the QPSK and QAM symbols of the DVB-T system into a single subcarrier signal in view of Horvath for the purpose of increasing the coverage area of the DVB system.

Furthermore, DVB Document A037 teaches that every subcarrier is modulated using a combination of QPSK, 16-QAM or 64-QAM symbols. However, DVB Document A037 does not specifically call for coherently modulating 16-QAM symbols and non-coherently modulating QPSK symbols.

Seki et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "In the differential QPSK method, data is made for transmission to correspond to a phase difference between symbols. At the receiving end, data can be demodulated by the (differential detection). Thus, there is an advantage in that a demodulator used is simple in construction as compared to that for the coherent detection system" (col.1, line 27-32).
- "On the other hand, the use of the OFDM modulation system for digital television broadcasting needs a high transmission rate. In order to increase the transmission rate, the use of a multi-valued modulation method for each carrier is required. With digital television broadcasting using the OFDM modulation system, a multi-valued QAM method is used as a modulation method for each carrier. With the multi-valued QAM system, however, unlike the above-described differential QPSK method, it is impossible to transmit data in the form of a phase difference between symbols and, at the receiving end, to demodulate data by the differential detection. In order to demodulate multi-valued QAM demodulated signals, seeking the amplitude and phase of each carrier at the

receiving end is required. For the multi-valued QAM system, therefore, a method has been proposed by which, at the transmitting end, reference symbols whose amplitude and phase are already known are transmitted periodically and, at the receiving end, the reference symbols are used as the reference amplitude and phase in demodulating multi-valued QAM symbols" (col.1, lines 41-60).

Therefore, it would have been obvious to one having ordinary skill in the art to modulate the hierarchical high priority QPSK stream of DVB-T using a non-coherent modulation circuit and to modulate the hierarchical low priority QAM stream of DVB-T using a coherent modulation circuit in view of Seki et al for the purpose of implementing the modulation of the hierarchical signal in manners well known in the art.

In regards to claim 2; as applied to claim 1 above, Seki et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "For the multi-valued QAM system, therefore, a method has been proposed by which, at the transmitting end, reference symbols whose amplitude and phase are already known are transmitted periodically and, at the receiving end, the reference symbols are used as the reference amplitude and phase in demodulating multi-valued QAM symbols" (col.1, lines 55-60).

  The reference symbols anticipate claimed coherently transmitted and corrected amplitudes in claim 2.

In regards to claim 3; as applied to claim 2 above, Seki et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "a multi-valued QAM method is used as a modulation method for each carrier" (col.1, lines 46-47).

The multi-valued QAM method used for each carrier anticipates claimed each of the Amplitude distortions due to frequency selectivity are separately corrected per subcarrier in claim 3.

In regards to claim 4; as applied to claim 1 above, Seki et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "a multi-valued QAM" (col.1, line 46), anticipating claimed multi-valued QAM of claim 4.

In regards to claim 6; as applied to claim 4 above, Murakami et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "With reference to FIG. 13, a pair of the I signal and the Q signal outputted from the quadrature baseband modulator in the transmitter (see FIG. 1), or the RF signal outputted from the RF portion in the transmitter is composed of a stream of frames each having N successive symbols. Here, N denotes a predetermined natural number. In every frame, the first symbol results from the QPSK modulation, and the second and later symbols result from the 16-value QAM. The first symbol in every frame (that is, the QPSK symbol in every frame) is used by the receiver as a pilot symbol for estimating an amplitude distortion amount and a frequency offset amount. It should be noted that every pilot symbol also carries a part of the main information to be transmitted"(page 8, paragraph 0178).

The frame containing a QPSK symbol and QAM symbols anticipates claimed correction factor determined from QPSK symbols, combined in one respective frame, and comprising a defined number of QAM data symbols and QPSK control signals in claim 6.

In regards to claim 7; as applied to claim 4 above, Seki et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "Effective data other than the reference data is transmitted as 16 QAM symbols" (col.6, lines 31-32), anticipating claimed 16 QAM symbol of claim 7.

In regards to claim 9; as applied to claim 1 above, Murakami et al teaches another method of modulating and demodulating a signal having QPSK and QAM symbols wherein:

- "FIG. 7 is a time-domain diagram of a symbol stream" (page 3, paragraph 0049, FIG. 7).

The symbol stream in figure 7 anticipates claimed frame structure comprising n QPSK symbols followed by m 16 QAM symbols.

Claim Objections

Claims 5, 8, and 11-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claim 11; the phrase "(QPSK) conrol symbols" in line 4 should be replaced with the phrase "(QPSK) control symbols".

In regards to claim 13; the phrase "defined numer" in line 3, should be replaced with the phrase "defined number".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Munoz whose telephone number is 703-305-4224. The examiner can normally be reached on Monday-Friday 8:30a.m-4:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9313 for regular communications and 703-872-9313 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Guillermo Munoz

GM
April 5, 2003

STEPHEN CHIN
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